



National Telecommunications and Information Administration

[Docket No. 221202-0260]

RIN 0693-XC053

Public Wireless Supply Chain Innovation Fund Implementation

AGENCY: National Telecommunications and Information Administration, Department of Commerce.

ACTION: Notice, request for comment.

SUMMARY: The National Telecommunications and Information Administration (NTIA) is requesting comment on the implementation of the Public Wireless Supply Chain Innovation Fund, as directed by the *CHIPS and Science Act of 2022*. Through this Notice and Request for Comment (Notice), NTIA seeks broad input and feedback from all interested stakeholders—including private industry, academia, civil society, and other experts—on this grant program to support the promotion and deployment of open, interoperable, and standards-based radio access networks (RAN).

DATES: Submit written comments on or before 5 p.m. Eastern Standard Time on January 27, 2023.

ADDRESSES: All electronic public comments on this action, identified by *Regulations.gov* docket number NTIA–2022–0003, may be submitted through the Federal e-Rulemaking Portal at <http://www.regulations.gov>. The docket established for this rulemaking can be found at www.Regulations.gov, NTIA–2022–0003. Click the “Comment Now!” icon, complete the required fields, and enter or attach your comments.

In addition to inviting written submissions through this Notice, NTIA is hosting a public virtual listening session. More information about the listening session can be found at

<https://www.ntia.doc.gov/>.

FOR FURTHER INFORMATION CONTACT: Please direct questions regarding this Notice to innovationfund@ntia.gov, indicating “Notice and Request for Comment” in the subject line, or, if by mail, addressed to National Telecommunications and Information Administration, U.S. Department of Commerce, 1401 Constitution Avenue NW, Washington, DC 20230; or by telephone to Sarah Skaluba, 202-482-3806. Please direct media inquiries to (202) 482-7002, or NTIA’s Office of Public Affairs, press@ntia.gov.

SUPPLEMENTARY INFORMATION:

I. Background

On August 9, 2022, President Biden signed the *CHIPS and Science Act of 2022* into law, appropriating \$1.5 billion for the Public Wireless Supply Chain Innovation Fund (referred to subsequently herein as the “Innovation Fund”), to support the promotion and deployment of open, interoperable, and standards-based radio access networks (RAN) (Public Law 117-167, Div. A, Sect. 106, 136 Stat. 1392). The Innovation Fund was previously authorized under section 9202(a)(1) of the *William M. (Mac) Thornberry National Defense Authorization Act for Fiscal Year 2021* (Public Law 116-283; 47 U.S.C. 906(a)(1)).

With the passage of the *CHIPS and Science Act of 2022*, Congress has taken a proactive step in driving the adoption of open, interoperable, and standards-based RAN and supporting a more competitive and diverse telecommunications supply chain. This historic \$1.5 billion investment aims to support U.S. leadership in the global telecommunications ecosystem, foster competition, lower costs for consumers and network operators, and strengthen our supply chain.

Today’s fifth generation wireless technology (known as “5G”) infrastructure market is highly consolidated, with a small group of vendors making up the majority of the marketplace. This lack of competition can reduce supply chain resilience and security, contribute to higher prices, make it challenging for new, innovative U.S. companies to break into the market, and ultimately will exacerbate the digital divide. Additionally, certain equipment and services produced or provided by particular vendors in this marketplace have been deemed to pose an unacceptable

risk to the national security of the United States.¹ Some of these vendors, including Chinese telecommunications companies Huawei Technologies Company and ZTE Corporation, have been shown to have links to the Chinese government and/or the Chinese Communist Party, giving rise to security risks.² Those risks are compounded by financial support from the government of China and preferential access to the Chinese market, which enable them to offer lower cost financing terms and, in some cases, below-market export credit subsidies to foreign mobile operators to purchase their equipment. The United States Government is working to mobilize the full range of department and agency tools and coordinating with like-minded partners to support network operators in procuring trusted, secure RAN.

In line with the Executive Branch's policy to promote the development of Open Radio Access Networks (or Open RAN), alongside other policies, technologies, and architectures that support 5G vendor diversity and foster market competition, the *CHIPS and Science Act of 2022* invests \$1.5 billion over 10 years to accelerate the development and deployment of open and interoperable, standards-based RAN.

More specifically, the Innovation Fund will support the following activities, as defined in 47 U.S.C. 906(a)(1)(C):

1. Promoting and deploying technology, including software, hardware, and microprocessing technology, that will enhance competitiveness in 5G and successor wireless technology supply chains that use open and interoperable interface radio access networks.
2. Accelerating commercial deployments of open interface, standards-based, interoperable equipment, such as equipment developed pursuant to the standards set forth by organizations such as the O-RAN Alliance, the Telecom Infra Project, [3rd

¹ See the Federal Communications Commission's List of Equipment and Services Covered by Section 2 of The Secure Networks Act, <https://www.fcc.gov/supplychain/coveredlist>.

² See, e.g., Permanent Select Committee on Intelligence, U.S. House of Representatives, Investigative Report on the U.S. National Security Issues Posed by Chinese Telecommunications Companies Huawei and ZTE at iv (Oct. 8, 2012), [https://republicans-intelligence.house.gov/sites/intelligence.house.gov/files/documents/huaweizte%20investigative%20report%20\(final\).pdf](https://republicans-intelligence.house.gov/sites/intelligence.house.gov/files/documents/huaweizte%20investigative%20report%20(final).pdf).

Generation Partnership Project (3GPP)], the Open-RAN Software Community, or any successor organizations.

3. Promoting and deploying compatibility of new 5G equipment with future open standards-based, interoperable equipment.
4. Managing integration of multi-vendor network environments.
5. Identifying objective criteria to define equipment as compliant with open standards for multi-vendor network equipment interoperability.
6. Promoting and deploying security features enhancing the integrity and availability of equipment in multi-vendor networks.
7. Promoting and deploying network function virtualization to facilitate multi-vendor interoperability and a more diverse vendor market.

NTIA, in consultation with the Federal Communications Commission, the National Institute of Standards and Technology, the Department of Homeland Security, the Department of Defense, and the Intelligence Advanced Research Projects Activity of the Office of the Director of National Intelligence, is responsible for establishing the grant criteria and administering the program. As such, NTIA has established multiple avenues for the public to offer input to inform program design and implementation. This includes a public virtual listening session (see **ADDRESSES**), as well as the opportunity for stakeholders across the nation to make their views known in response to this Notice. NTIA welcomes input from all interested parties.

As the Executive Branch agency statutorily responsible for advising the President on telecommunications policy issues and managing federal spectrum, this investment will leverage NTIA's leadership in the areas of 5G and future generation telecommunications, supplier diversity, and spectrum management, among others. The program will also build upon the Department's grantmaking expertise, as NTIA continues to advance the \$65 billion Internet for All program to connect every American to high-speed, affordable internet service.

This critical investment will help drive U.S. wireless innovation, foster competition, and strengthen supply chain resilience. It will also help unlock opportunities for U.S. companies, particularly small and medium enterprises, to compete in a market historically dominated by a few foreign suppliers, including high-risk suppliers that raise security concerns. In comparison to traditional telecommunications networks, which utilize a single supplier's proprietary equipment, open and interoperable, standards-based RAN prevents vendor lock-in by facilitating competition. This competition allows operators to procure the best solutions for their specific needs by mixing and matching network components, rather than procuring proprietary end-to-end solutions from a single supplier. Open and interoperable, standards-based RAN may also reduce costs for consumers and network operators in the long run by improving efficiency through automation, supporting more seamless network updates, and potentially lowering capital expenditures (CapEx) and operating expenses (OpEx).

II. Objectives of This Notice

This Notice offers an opportunity for all interested parties to provide vital input and recommendations for consideration in the development and implementation of NTIA's Innovation Fund grant program. NTIA seeks public input and feedback from a wide array of stakeholders to inform the implementation of the Innovation Fund grant program. This is a historic investment, requiring the combined efforts of the Federal government, state and local governments, the U.S. private sector, non-governmental organizations, and likeminded partners from around the world.

This Notice seeks public comment to bolster NTIA's work and to improve the number and quality of ideas under consideration as the agency develops Notices of Funding Opportunity (NOFOs). These formal announcements (NOFOs) will be used to solicit applications for Innovation Fund grants and will provide information about the size of the awards, who is eligible

to apply, the evaluation criteria for selection of an awardee, required components of an application, and how to submit an application.

This Notice also offers an opportunity for stakeholders to provide detailed comments and recommendations on the kinds of projects and programs the Innovation Fund should aim to support. Rather than focusing on the benefits of open, interoperable, and standards-based network deployments, such as Open RAN, or more general policy general policy recommendations detailed in previous FCC and NTIA processes,³ this Notice particularly welcomes comment on: (1) practical solutions to the key challenges to adoption of open and interoperable, standards-based RAN; (2) recommendations for the kinds of projects that the Innovation Fund should support; and (3) the kinds of criteria that should inform how Innovation Fund grants are awarded.

III. Request for Comment

NTIA welcomes input on any matter that commenters believe is important to NTIA's Innovation Fund implementation efforts. Commenters are invited to comment on the full range of issues presented by this Notice and are encouraged to address any or all of the following questions, or to provide additional information relevant to implementation of the Innovation Fund. We invite commenters who intend to apply or who have experience with other funding programs (whether domestic or international) to offer suggestions for how to effectively implement the Innovation Fund, based on their experiences.

Commenters are not required to respond to all questions. When responding to one or more of the questions below, please note in the text of your response the number of the question to which

³ Whereas the FCC's *Notice of Inquiry on Promoting the Deployment of 5G Open Radio Access Networks* (March 2021), NTIA's Industry Listening Session on *Vendor Diversity for 5G Security* (February 2021), and NTIA's *National Strategy to Secure 5G Implementation Plan* (January 2021), explored the current status of Open RAN, its costs and benefits, and policy recommendations, more generally; this Request seeks comment on tangible solutions and recommendations to inform development and implementation of the Innovation Fund.

you are responding. Commenters are welcome to provide specific actionable proposals, rationales, and relevant facts.

Commenters should include a page number on each page of their submissions. Please do not include in your comments information of a confidential nature, such as sensitive personal information or proprietary information. All comments received are a part of the public record and will generally be posted to Regulations.gov without change. All personal identifying information (e.g., name, address) voluntarily submitted by the commenter may be publicly accessible. Information obtained as a result of this notice may be used by the federal government for program planning on a non-attribution basis.

Questions on the State of the Industry:

Understanding the current state of the telecommunications industry is important to determining how any topics should be prioritized in the Innovation Fund, and what level of funding a topic should receive.

1. What are the chief challenges to the adoption and deployment of open and interoperable, standards-based RAN, such as Open RAN? Are those challenges different for public vs. private networks?
 - a. What are the challenges for brownfield deployments, in which existing networks are upgraded to incorporate open, interoperable, and standards-based equipment?
2. What ongoing public and private sector initiatives may be relevant to the Innovation Fund?
 - a. What gaps exist from an R&D, commercialization, and standards perspective?
 - b. How might NTIA best ensure funding is used in a way that complements existing public and private sector initiatives?
3. What kind of workforce constraints impact the development and deployment of open and interoperable, standards-based RAN, such as Open RAN? How (if at all) can the Innovation Fund help alleviate some of these workforce challenges?

4. What is the current climate for private investment in Open RAN, and how can the Innovation Fund help increase and accelerate the pace of investment by public and private entities?
5. How do global supply chains impact the open, interoperable, and standards-based RAN market, particularly in terms of procuring equipment for trials or deployments?

Questions on Technology Development and Standards:

Understanding the current state of open and interoperable, standards-based RAN and the standards that inform its development will assist NTIA in maximizing the impact of grants.

Questions in this section will be used to assess the maturity of the technology and related standards to help determine which topics should receive additional investment.

6. What open and interoperable, standards-based network elements, including RAN and core network elements, would most benefit from additional research and development (R&D) supported by the Innovation Fund?
7. Are the 5G and open and interoperable RAN standards environments sufficiently mature to produce stable, interoperable, cost-effective, and market-ready RAN products? If not:
 - a. What barriers are faced in the standards environment for open and interoperable RAN?
 - b. What is required, from a standards perspective, to improve stability, interoperability, cost effectiveness, and market readiness?
 - c. What criteria should be used to define equipment as compliant with open standards for multivendor network equipment interoperability?
8. What kinds of projects would help ensure 6G and future generation standards are built on a foundation of open and interoperable, standards-based RAN elements?

Questions on Integration, Interoperability, and Certification:

Challenges associated with systems integration and component interoperability can hinder the adoption of open and interoperable, standards-based RAN. This section will help NTIA structure the NOFOs in a way that most effectively addresses these challenges and facilitates adoption. NTIA also welcomes feedback on the effectiveness of certification regimes in driving open and interoperable, standards-based RAN adoption.

9. How can projects funded through the Innovation Fund most effectively support promoting and deploying compatibility of new 5G equipment with future open, interoperable, and standards-based equipment?
 - a. Are interoperability testing and debugging events (e.g., “plugfests”) an effective mechanism to support this goal? Are there other models that work better?
10. How can projects funded through the program most effectively support the “integration of multi-vendor network environments”?
11. How do certification programs impact commercial adoption and deployment?
 - a. Is certification of open, interoperable, standards-based equipment necessary for a successful marketplace?
 - b. What bodies or fora would be appropriate to host such a certification process?
12. What existing gaps or barriers are presented in the current RAN and open and interoperable, standards-based RAN certification regimes?
 - a. Are there alternative processes to certification that may prove more agile, economical, or effective than certification?
 - b. What role, if any, should NTIA take in addressing gaps and barriers in open and interoperable, standards-based RAN certification regimes?

Questions on Trials, Pilots, Use Cases, and Market Development:

A key aim of the Innovation Fund is to promote and deploy technologies that will enhance competitiveness of 5G and successor open and interoperable, standards-based RAN. We have

seen a range of Open RAN trials, pilots, and use cases underway across the United States and internationally to date. This section will inform the types of NOFOs NTIA publishes and administers as the Department works to accelerate adoption.

13. What are the foreseeable use cases for open and interoperable, standards-based networks, such as Open RAN, including for public and private 5G networks? What kinds of use cases, if any, should be prioritized?
14. What kinds of trials, use cases, feasibility studies, or proofs of concept will help achieve the goals identified in 47 U.S.C. 906(a)(1)(C), including accelerating commercial deployments?
 - a. What kinds of testbeds, trials, and pilots, if any, should be prioritized?
15. How might existing testbeds be utilized to accelerate adoption and deployment?
16. What sort of outcomes would be required from proof-of-concept pilots and trials to enable widespread adoption and deployment of open and interoperable, standards-based RAN, such as Open RAN?

Questions on Security:

Strengthening supply chain resilience is a critical benefit of open and interoperable, standards-based RAN adoption. In line with the Innovation Fund's goal of "promoting and deploying security features" to enhance the integrity and availability of multi-vendor network equipment, and Department priorities outlined in the National Strategy to Secure 5G Implementation Plan, this section will inform how NTIA incorporates security into future Innovation Fund NOFOs.

17. "Promoting and deploying security features enhancing the integrity and availability of equipment in multi-vendor networks," is a key aim of the Innovation Fund (47 U.S.C 906(a)(1)(C)(vi)). How can the projects and initiatives funded through the program best address this goal and alleviate some of the ongoing concerns relating to the security of open and interoperable, standards-based RAN?
 - a. What role should security reporting play in the program's criteria?

- b. What role should security elements or requirements, such as industry standards, best practices, and frameworks, play in the program's criteria?
18. What steps are companies already taking to address security concerns?
 19. What role can the Innovation Fund play in strengthening the security of open and interoperable, standards-based RAN?
 20. How is the "zero-trust model" currently applied to 5G network deployment, for both traditional and open and interoperable, standards-based RAN? What work remains in this space?

Questions on Program Execution and Monitoring:

The Innovation Fund is a historic investment in America's 5G future. As such, NTIA is committed to developing a program that results in meaningful progress toward the deployment and adoption of open and interoperable, standards-based RAN. To accomplish this, we welcome feedback from stakeholders on how our program requirements and monitoring can be tailored to achieve the goals set out in 47 U.S.C. 906.

21. Transparency and accountability are critical to programs such as the Innovation Fund. What kind of metrics and data should NTIA collect from awardees to evaluate the impact of the projects being funded?
22. How can NTIA ensure that a diverse array of stakeholders can compete for funding through the program? Are there any types of stakeholders NTIA should ensure are represented?
23. How (if at all) should NTIA promote teaming and/or encourage industry consortiums to apply for grants?
24. How can NTIA maximize matching contributions by entities seeking grants from the Innovation Fund without adversely discouraging participation? Matching requirements can include monetary contributions and/or third-party in-kind contributions (as defined in 2 CFR 200.1).

25. How can the fund ensure that programs promote U.S. competitiveness in the 5G market?
- a. Should NTIA require that grantee projects take place in the U.S.?
 - b. How should NTIA address potential grantees based in the U.S. with significant overseas operations and potential grantees not based in the U.S. (i.e., parent companies headquartered overseas) with significant U.S.-based operations?
 - c. What requirements, if any, should NTIA take to ensure “American-made” network components are used? What criteria (if any) should be used to consider whether a component is “American-made”?
26. How, if at all, should NTIA collaborate with like-minded governments to achieve Innovation Fund goals?

Additional Questions:

NTIA welcomes any additional input that stakeholders believe will prove useful to our implementation efforts.

27. Are there specific kinds of initiatives or projects that should be considered for funding that fall outside of the questions outlined above?
28. In addition to the listening session mentioned above and forthcoming NOFOs, are there other outreach actions NTIA should take to support the goals of the Innovation Fund?

Dated: December 7, 2022.

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